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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/501,005	11/22/2004	Masayuki Takenaka	Q81942	3345
23373 7590 03/12/2007 SUGHRUE MION, PLLC 2100 PENNSYLVANIA AVENUE, N.W. SUITE 800 WASHINGTON, DC 20037			EXAMINER PRESTON, ERIK D	
			ART UNIT	PAPER NUMBER
			2834	
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		03/12/2007	PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/501,005

Applicant(s)

TAKENAKA ET AL.

Examiner

Erik D. Preston

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 July 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 5-11 is/are rejected.
- 7) ☒ Claim(s) 4 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 July 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>7/8/04</u> ; <u>1/25/06</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the drive unit casing side fins extending toward the heat sink and contacting the heat sink side fins in a state of low thermal conduction (claim 6) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

Claim 11 is objected to because of the following informalities: In the last line of the claim, the phrase "...the drive-unit-casing side fins..." lacks proper antecedent basis and, for examination purposes, will be interpreted as saying "...the drive-unit-casing side fins ..." Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1 & 6-10 are rejected under 35 USC 112 2nd paragraph.

The term "low thermal conduction" as included in the last two lines of claim 1 is a relative term which renders the claim indefinite. The term "low thermal conduction" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. One having ordinary skill in the art would not necessarily consider two pieces of metal in direct contact with one another to be in a state of low thermal conduction, nor does the spec. offer an example of what would constitute "low" thermal conduction. For examination purposes, the examiner will interpret the state of low thermal conduction as being a function of the heat sink's fins being tapered toward the point at which they contact the drive unit casing (as seen in Fig. 2 of the instant application).

Claim 7 recites the limitation "the separation means" in its 2nd line. There is insufficient antecedent basis for this limitation in the claim. For examination purposes,

claim 7 will be treated as if it were dependent upon claim 2, and claim 10 will be treated as if it were dependent upon claim 6.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1,6 & 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki et al. (US 2001/0014029, supplied by applicant) in view of Bacumel et al. (US 6198183, supplied by applicant) in view of Becker et al. (US 6039114).

With respect to claim 1, Suzuki teaches a drive unit including: an electric motor (Fig. 11, #305); a casing (Fig. 2, #1), an inverter (Fig. 2, #102) that controls the electric motor, and a flow passage (as seen in Fig. 3) of a refrigerant that cools the inverter, the drive unit characterized in that the inverter is mounted on the drive unit casing such that a heat sink (Fig. 2, #104) united with a substrate (Fig. 2, #103) of the inverter defines a space (as seen in Fig. 2) on a portion thereof opposed to the casing, the space is communicated to the flow passage of the refrigerant, the heat sink comprises heat-sink side fins (Fig. 2, #105) extending into a space toward the casing, and the heat-sink side fins and the casing contact with each other (as seen in Fig. 2); but it does not explicitly teach (1) the casing explicitly being a drive unit casing accommodating therein the electric motor, or (2) the fins and casing being in a state of low thermal conduction.

However, Bacumel teaches a drive unit having a drive unit casing (Fig. 2, #23) accommodating therein the electric motor (Fig. 2, #2); and Becker teaches heat-sink fins (Fig. 3a, #5) that taper into a connection point to form a cooling channel (Fig. 3a, #6).

It would have been obvious to one of ordinary skill in the art at the time of the invention to: (1) modify the electric motor and drive unit of Suzuki in view of the integrated drive unit and casing as taught by Bacumel because it provides a means for achieving a very compact and reliable construction in which the electric motor and the electronic module share a common water cooling circuit (Bacumel, Abstract); and (2) modify the heat-sink fins of Suzuki in view of the tapered cross section as taught by Becker because it provides a means for further improving heat dissipation, while saving base material during production (Becker, Col. 3, Lines 39-55).

With respect to claim 6, Suzuki in view of Bacumel in view of Becker teaches the drive unit of claim 1, and Becker teaches that the drive unit casing comprises drive-unit-casing side fins (as seen in Fig. 3a) extending into space toward the heat sink.

With respect to claim 8, Suzuki in view of Bacumel in view of Becker teaches the drive unit of claim 1, and Suzuki teaches that the inverter is received in an inverter casing composed of a member separate from the inverter with a substrate thereof fixed to a bottom wall of the inverter casing and constituting a heat sink, of which a substrate is united with the bottom wall of the inverter casing (as seen in Fig. 2).

With respect to claim 9, Suzuki in view of Bacumel in view of Becker teaches the drive unit of claim 1, and Suzuki teaches that the inverter together with the heat sink that is united with a substrate thereof are received in an inverter casing composed of a member separate from the inverter (as seen in Fig. 2).

With respect to claim 10, Suzuki in view of Bacumel in view of Becker teaches the drive unit of claim 6, and both Suzuki & Becker teach that the heat-sink side fins and the drive-unit-casing side fins cooperatively generate a common refrigerant flow pattern within the space (Suzuki, Fig. 2; Becker, Fig. 3a).

Claims 2,3,5,7 & 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hara et al. (US 6323613) in view of Regnier et al. (US 6236566, supplied by applicant).

With respect to claim 2, Hara teaches a drive unit including: an electric motor (Fig. 9, M), a drive unit casing (Fig. 9, #13) accommodating therein the electric motor, and inverter (Fig. 9, U) that controls the electric motor, and a flow passage (as seen in Fig. 6) of a refrigerant that cools the inverter, the drive unit characterized in that the inverter is mounted on the drive unit casing such that a heat sink (Fig. 6, #11) united with a substrate (as seen in Fig. 9) of the inverter defines a space on a portion thereof opposed to the drive unit casing (as seen in Fig. 9), the space is communicated to the flow passage of the refrigerant (as seen in Fig. 6), the heat sink comprises heat-sink side fins extending into the space toward the drive unit casing, separation means (Fig. 9, #12) for preventing thermal conduction is provided in the space, but it does not

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explicitly teach both the heat sink fins and the drive unit casing directly contacting the separation means (Fig. 9, appears to teach such an arrangement, but not clearly).

However, Regnier teaches heat sink fins (Fig. 5, #44) directly contacting a separation means (Fig. 5, #46). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the fins and separation means of Hara in view of the direct contact as taught by Regnier because optimizes the exchange of heat via the fins by preventing an unwanted flow of water around them (Regnier, Col. 4, Lines 5-11).

With respect to claim 3, Hara in view of Regnier teaches the drive unit of claim 2, wherein the separation means comprises a low thermal conductive member (Hara, Col. 8, Lines 25-40 & Regnier, Col. 4, Lines 5-11).

With respect to claim 5, Hara in view of Regnier teaches the drive unit of claim 2, wherein the separation means comprises a laminated (layered) member. The limitation of the separation means being formed by laminating a low thermal conductive member on a separation member is a method limitation given little patentable weight in an apparatus claim.

With respect to claim 7, Hara in view of Regnier teaches the drive unit of claim 2, and Hara teaches that the space is compartmented by the separation means into a first chamber facing toward the heat sink, and a second chamber facing toward the drive unit casing (as seen in Fig. 6).

With respect to claim 11, Hara in view of Regnier teaches the drive unit of claim 3, and Hara teaches that the low thermal conductive means is shaped to follow contact portions of the heat-sink side fins and drive-unit-casing side fins (as seen in Fig. 9).

Allowable Subject Matter

Claim 4 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: With respect to claim 4, while prior art does teach some of the material included in the claims, it does not teach the combination comprising a plurality of separation members with a space therebetween.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Erik D. Preston whose telephone number is (571)272-8393. The examiner can normally be reached on Monday through Friday 8-5.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Darren Schuberg can be reached on (571)272-2044. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



02/21/2007


BURTON S. MULLINS
PRIMARY EXAMINER